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claims, the orthogonal sequence having been developed as a function of first and second existing orthogonal sequences. The Office Action then recognizes that Suzuki fails to explicitly disclose a perfectly white spectrum should the orthogonal sequence be repeated an infinite number of times. However, continues the Office Action, Blanz teaches a white spectrum upon repeating the orthogonal sequences. Thus, concludes the Office Action, that one of ordinary skill in the art would modify Suzuki's system by including orthogonal sequences that would produce a white spectrum in order to retrieve the desired signal at the receiving end.

In response to applicants' previous comments, the Office Action states that it understands that Blanz's white spectrum is coming from a white noise source, and it is known that white noise exists. Furthermore, continues the Office Action, the spectrum described in Blanz is a white spectrum, and it would be obvious to supply the white noise to the transmitter. In this regard, the Office Action concludes that the white noise spectrum provided at the transmitter would have the same effect if the white noise were provided in the channel.

This ground of rejection is respectfully traversed for the following reasons.

The Office Action has completely mischaracterized Blanz, and has drawn incorrect conclusions therefrom even had the Blanz reference been properly characterized by the Office Action. First and foremost, Blanz does not teach a white spectrum upon repeating the orthogonal sequences. (See column 8, line 58 to column 7, line 23.)

Rather, as to white noise, Blanz merely takes into account the possibility that there may be white noise in the channel being estimated, represented by the noise vector n . As is well-known, noise is naturally occurring and undesirable, but if it exists, it must be characterized and accounted for as part of the channel to accurately represent the channel. This is because any noise that exists in a channel gets added to the transmitted signal as the transmitted signal passes through the channel. Thus, the naturally occurring and undesirable white noise in Blanz is not taught as being from any particular "white noise source", the Office Action's statement to the contrary notwithstanding. Rather, Blanz is merely explaining how to characterize a channel in which the naturally occurring noise

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in the channel happens to have a substantially white spectrum. Nevertheless, note still that the white noise present in Blanz is bad.

Since the white noise in Blanz is considered to be bad, Blanz most certainly does not teach or suggest to supply white noise at the transmitter as proposed by the Office Action. Indeed, the opposite is true. At the transmitter, one wants to supply only signal, not noise. In fact, the more noise there is, the harder it is at the receiver to detect the transmitted signal, which is why noise is bad. Hence, one would not include a white noise source at the transmitter as proposed by the Office Action.

Furthermore, even if 1) Blanz had suggested a white noise source, and even if 2) such a white noise source were to be located at the transmitter, neither of which is true in the slightest, there is still no teaching or suggestion in Blanz that such a white noise source be, or even that it is desireable that the white noise source be, a new orthogonal sequence that was developed as a function of first and second existing orthogonal sequences and would have a perfectly white spectrum were it were to be repeated an infinite number of times. Indeed, such a new white noise source would not be suggested. Rather, an already known conventional white noise source could at best be suggested. But of course, no white noise source is actually suggested by Blanz. Rather, to the contrary, Blanz does not teach to add white noise to the signal at any point, because noise occurs naturally in a channel and is bad.

It has already been settled, and the Office Action agrees at least, that there is no indication that any sequence that is produced in Suzuki as the combination of two existing orthogonal sequences has a perfectly white spectrum should such a sequence be repeated an infinite number of times. In fact, applicants maintain that Suzuki does not teach orthogonal sequences as all, but rather produces merely pseudo orthogonal signals. Thus, Suzuki fails to teach a source of an orthogonal sequence which is repeatedly supplied, the orthogonal sequence having been developed as a function of first and second existing orthogonal sequences and being such that would it have a perfectly white spectrum were it to be repeated an infinite number of times, as required by applicants' independent claims 1, 6, 15, 18, 24, 25, 34, and 37.

Blanz does not correct this deficiency.

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Blanz does not teach the generation of any white spectrum signal, or the desirability of same. As explained above, notwithstanding the Office Action statement to the contrary, the only mention of "white" in Blanz is in connection with undesired noise, that naturally exists in a channel being estimated. Thus, noise is not in any way "supplied" as required by applicants' claims. In other words, Blanz does not teach or suggest generation of a white spectrum, and certainly not generation of a white spectrum in connection with a repeating orthogonal sequence signal.

Furthermore, even with impermissible hindsight from applicants' invention, if one were to combine Suzuki with Blanz, the result would be some pseudo-orthogonal (which is at best similar to, but not actually orthogonal) signal, derived in a very different manner from applicants' actually orthogonal signal to which white noise is added by nature as the pseudo orthogonal signal travels through the channel. Note, importantly, that the addition by nature of white noise to the signal does not make the signal have a white spectrum.

Additionally, applicants' claims 10, 29, and 33 each requires that there is no channel filtering performed between the demodulator and the FIR filter implementing a least squares algorithm. Such filtering is implicitly required, as is well known by those of ordinary skill in the art, even if not shown in a transmitter, when sequences that do not have a perfectly white spectrum should they be repeated an infinite number of times are employed as in Suzuki. Furthermore, in Suzuki there is no teaching of an FIR filter implementing a least squares algorithm. Thus, the combination of Suzuki and Blanz does not teach or suggest all of the elements of applicants' independent claims 10, 29, and 33.

Thus, all of applicants' independent claims are allowable over Suzuki and Blanz under 35 U.S.C. 103. Since all of the dependent claims that depend from the allowable independent claims include all the limitations of the respective independent claim from which they ultimately depend, each such dependent claim is also allowable over the combination of Suzuki and Blanz under 35 U.S.C. 103.

Dependent claims 11-14, 16-23, 26-32, and 34-36 are apparently rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki and Blanz in combination with one or more various additional references. Applicants say "apparently" in that these are all dependent claims, and so all of the limitations from the independent claim must be met as

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well as the additional limitations added by the dependent claim. Since all the rejections of the independent claims rely on the combination of Suzuki and Blanz, applicant assumes that the Office Action intended to include Blanz in the combinations on which the rejection is based. If not, each of the rejections are merely copied over from the prior Office Action, and were already traversed by applicant in their prior amendment.

Assuming applicants are correct, they note that each of the grounds of rejection of these dependent claims is predicated on the validity of the rejections of the independent claims under 35 U.S.C. 103 given Suzuki in combination with Blanz. Since those rejections have been traversed, as described hereinabove, and there is no argument put forth by the Office Action that any of the additional references supplies that which is missing from the combination of Suzuki and Blanz, to render the independent claims obvious, these grounds of rejection cannot be maintained.

Therefore, applicants' claims are allowable under 35 U.S.C. 103.

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Conclusion

It is respectfully submitted that the Office Action's rejections have been overcome and that this application is now in condition for allowance. Reconsideration and allowance are, therefore, respectfully solicited.

If, however, the Examiner still believes that there are unresolved issues, he is invited to call applicant's attorney so that arrangements may be made to discuss and resolve any such issues.

In the event that an extension of time is required for this amendment to be considered timely, and a petition therefor does not otherwise accompany this amendment, any necessary extension of time is hereby petitioned for, and the Commissioner is authorized to charge the appropriate cost of such petition to the Lucent Technologies Deposit Account No. 12-2325.

Respectfully,

E. Beck
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Date: 5/23/06

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